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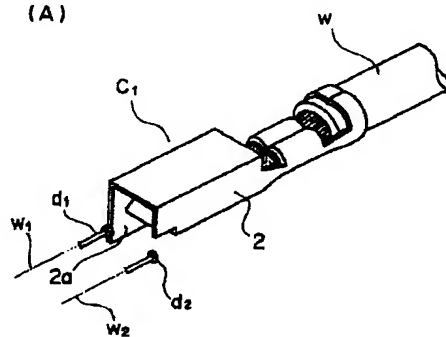
(54) 【発明の名称】 多極コネクタの端子金具検査方法及び検査具

(57) 【要約】

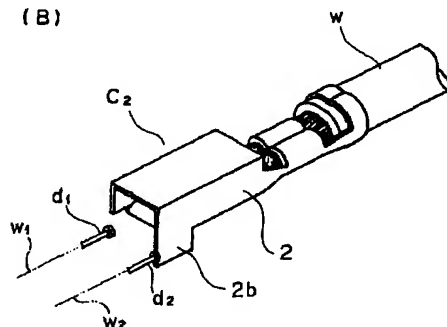
【目的】 本発明は、実質的に同一形状を有して構成金属素材を異にする複数種類の端子金具の識別検査方法に関するものである。

【構成】 多極コネクタAの複数の端子収容室に收容される複数種類の端子金具C<sub>1</sub>、C<sub>2</sub>の検査方法において、該複数種類の各端子金具C<sub>1</sub>、C<sub>2</sub>に対して相互に異なる位置に識別用付加部2a、2bを設け、検査具に該複数の識別用付加部2a、2bに対応する複数の検査用導通ピンd<sub>1</sub>、d<sub>2</sub>群を複数の端子収容室に対応して設けると共に各検査用導通ピンd<sub>1</sub>、d<sub>2</sub>をそれぞれ検査用回路w<sub>1</sub>、w<sub>2</sub>に接続し、検査時において該複数の検査用導通ピンd<sub>1</sub>、d<sub>2</sub>群の内の何れか1個を端子金具の識別用付加部2a、2bに接触させる。

(A)



(B)



## 【特許請求の範囲】

【請求項1】 多極コネクタの複数の端子収容室に収容される複数種類の端子金具の検査方法において、該複数種類の各端子金具に対して相互に異なる位置に識別用付加部を設け、検査具に該複数の識別用付加部に対応する複数の検査用導通ピン群を複数の端子収容室に対応して設けると共に各検査用導通ピンをそれぞれ検査用回路に接続し、検査時において該複数の検査用導通ピン群の内の何れか1個を端子金具の識別用付加部に接触させることを特徴とする多極コネクタの端子金具検査方法。

【請求項2】 多極コネクタの複数の端子収容室に収容される2種類の端子金具の検査方法において、該2種類の端子金具の一方に識別用付加部を設け、検査具に該2種類の端子金具に対応して検査用回路における2種類の検査用導通ピンを設けると共に2種類の検査用導通ピンを個別的に複数の端子収容室に対応して設け、該2種類の検査用導通ピンは軸方向の突出量が相互に相違している検査時に該検査用導通ピンの一方のみが該識別用付加部に接触することを特徴とする多極コネクタの端子金具検査方法。

【請求項3】 複数種類の端子金具が実質的に同一形状を有して構成金属素材を異にすることを特徴とする請求項1又は2に記載の多極コネクタの端子金具検査方法。

【請求項4】 複数種類の端子金具がメッキされた金属を異にすることを特徴とする請求項1、2又は3に記載の多極コネクタの端子金具検査方法。

【請求項5】 複数種類の端子金具が金メッキされた端子金具と錫メッキされた端子金具とから成ることを特徴とする請求項1、2、3又は4に記載の多極コネクタの端子金具検査方法。

【請求項6】 被検査コネクタの各端子収容室に対応して複数の検査用導通ピン群を設け、該複数の検査用導通ピンをそれぞれ検査用回路に接続し、検査時において該複数の検査用導通ピン群の内の1個が被検査コネクタの端子金具と接触することを特徴とする多極コネクタの端子金具検査具。

【請求項7】 被検査コネクタの各端子収容室に対応して2種類の検査用導通ピンの内の何れか一方を設けると共に該検査用導通ピンをそれぞれ検査用回路に接続し、該2種類の検査用導通ピンは相互に軸方向の突出量が相違していることを特徴とする多極コネクタの端子金具検査具。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】 本発明は、ワイヤハーネス等の接続に用いられる多極コネクタに関し、該多極コネクタの

ある。

## 【0002】

【従来の技術】 自動車用ワイヤハーネス中には、通常の信号回路用電線に加えて安全回路用電線が含まれており、これらの電線を一括して接続するコネクタ中においては、信号回路用電線に対しては銅素材の表面に錫メッキを施した端子金具が用いられ、安全回路用電線に対しては確実性に優る電気接続用として金メッキを施した端子金具が用いられる。

【0003】ところで、この場合の錫メッキ端子と金メッキ端子は通常同一形状であるので、導通検査では誤挿入の検出が不可能であり、そのため目視検査によって識別を行っているが、確実性に欠ける。

## 【0004】

【発明が解決しようとする課題】 本発明は上記した点に着目して為されたものであり、多極コネクタ中に収容された実質的に同一形状を有して構成金属素材を異にする複数の端子金具を確実に識別するようにしたものである。

## 【0005】

【課題を解決するための手段】 上記の目的を達成するため、本発明方法においては、多極コネクタの複数の端子収容室に収容される複数種類の端子金具の検査方法において、該複数種類の各端子金具に対して相互に異なる位置に識別用付加部を設け、検査具に該複数の識別用付加部に対応する複数の検査用導通ピン群を複数の端子収容室に対応して設けると共に各検査用導通ピンをそれぞれ検査用回路に接続し、検査時において該複数の検査用導通ピン群の内の何れか1個を端子金具の識別用付加部に接触させる構成を採用した。

【0006】また、本発明方法においては、多極コネクタの複数の端子収容室に収容される2種類の端子金具の検査方法において、該2種類の端子金具の一方に識別用付加部を設け、検査具に該2種類の端子金具に対応して検査用回路における2種類の検査用導通ピンを設けると共に2種類の検査用導通ピンを個別的に複数の端子収容室に対応して設け、該2種類の検査用導通ピンは軸方向の突出量が相互に相違している検査時に該検査用導通ピンの一方のみが該識別用付加部に接触する構成を採用した。

【0007】また、本発明の検査具においては、被検査コネクタの各端子収容室に対応して複数の検査用導通ピン群を設け、該複数の検査用導通ピンをそれぞれ検査用回路に接続し、検査時において該複数の検査用導通ピン群の内の1個が被検査コネクタの端子金具と接触する構成を採用した。

ピンは相互に軸方向の突出量が相違している構成を採用した。

#### 【0009】

【作用】複数の識別用付加部に対応して設けた複数の検査用導通ピン群において、検査時においては当該被検査端子金具の識別用付加部に対向する検査用導通ピンのみが検査用回路を作動させる。

【0010】軸方向の突出量が異なる2種類の検査用導通ピンにおいて、突出量の多い検査用導通ピンは常に被検査端子金具と接触し、突出量の少ない検査用導通ピンはこれに対応する特別の端子金具が収容されている場合にのみ、これと接触する。

#### 【0011】

【実施例】図1において、多極コネクタAは合成樹脂製のコネクタハウジングB内に4個の端子収容室1を有し、上段の2個の端子収容室1には安全回路用の金メッキを施した雌型端子金具C<sub>1</sub>が収容され、下段の2個の端子収容室1には信号回路用の錫メッキを施した雌型端子金具C<sub>2</sub>が収容されている。

【0012】図2に示される如くに、両雌型端子金具C<sub>1</sub>、C<sub>2</sub>は雌型電気接触部2に電線接続部3が連設されると共に電線接続部3には導線Wが接続された実質的に同一形状であってメッキの種類の相違により構成金属素材のみが相違し、ただ、金メッキを施した雌型端子金具C<sub>1</sub>には雌型電気接触部2の前方左下に突出した識別用付加部2aが設けられ、錫メッキを施した雌型端子金具C<sub>2</sub>には雌型電気接触部2の前方右下に突出した識別用付加部2bが設けられている。

【0013】Dは検査具であり、多極コネクタAを受け入れる検査室4内において、一対の検査用導通ピンd<sub>1</sub>、d<sub>2</sub>群が多極コネクタAの各端子収容室1に対応して4セット設けられている。各導通ピンd<sub>1</sub>、d<sub>2</sub>は支持孔5内において摺動自在であって内蔵するスプリング（図示せず）により前方へ付勢され、検査時に端子金具に当接して若干後退する。検査用導通ピンd<sub>1</sub>は金メッキを施した雌型端子金具C<sub>1</sub>の検出用であって検査回路の電線W<sub>1</sub>に接続され、検査用導通ピンd<sub>2</sub>は錫メッキを施した雌型端子金具C<sub>2</sub>の検出用であって検査回路の電線W<sub>2</sub>に接続される。

【0014】検査時においては、図4に示される如くに被検査コネクタAを検査具Dの検査室4内に挿入する。そして、金メッキを施した雌型端子金具C<sub>1</sub>の識別用付加部2aに対して検査用導通ピンd<sub>1</sub>が接触して電線W<sub>1</sub>による検査回路を作動させ、この際に検査用導通ピンd<sub>2</sub>は該端子金具C<sub>1</sub>と接触しない（図5（A）参照）。他方、錫メッキを施した雌型端子金具C<sub>2</sub>の識別用付加部2bに対して検査用導通ピンd<sub>2</sub>が接触して電線W<sub>2</sub>による検査回路を作動させ、この際に検査用導通ピンd<sub>1</sub>は該端子金具C<sub>2</sub>に接触しない（図5（B）参照）。

【0015】従って、特定の端子収容室1に収容される金メッキ又は錫メッキを施した端子金具C<sub>1</sub>、C<sub>2</sub>に対応して作動すべき電線W<sub>1</sub>又は電線W<sub>2</sub>による検査回路を予め設定しておき、判定手段Eにより導通又はエラーの表示を個別に表示するようにして導通検査と同時に誤挿入を検出する。

【0016】図6、図7の構造では、通常の錫メッキを施した雌型端子金具C<sub>2</sub>'の前端を開放した雌型電気接触部2内に前方の折り返し基部6aを介して折り返し弾性接触片6が設けられ（図7参照）、金メッキを施した雌型端子金具C<sub>1</sub>'の雌型電気接触部2内には同様に折り返し基部6aを介して折り返し弾性接触片6が設けられると共に雌型電気接触部2の前端下部に識別用付加部2cが側壁より内側へ折曲して設けられている。

【0017】雌型端子金具C<sub>1</sub>'、C<sub>2</sub>'をコネクタハウジングB'の端子収容室1'内に収容した多極コネクタA'を、検査具D'内に挿入して導通検査と同時に金メッキを施した端子金具C<sub>1</sub>'の存否を検査する。即ち、検査具D'内には各端子収容室1'に対応して金メッキを施した雌型端子金具C<sub>1</sub>'の検査用導通ピンd<sub>1</sub>'又は錫メッキを施した雌型端子金具C<sub>2</sub>'の検査用導通ピンd<sub>2</sub>'が設けられ、各検査用導通ピンd<sub>1</sub>'、d<sub>2</sub>'は摺動自在にして前方の一定突出位置に付勢して設けられ、検査用導通ピンd<sub>2</sub>'の先端は検査用導通ピンd<sub>1</sub>'の先端よりも寸法l（約1.5mm）だけ軸方向前方に位置している（図8参照）。

【0018】従って、検査時においては、検査用導通ピンd<sub>2</sub>'は錫メッキを施した雌型電気接触部2内において弾性接触片6の折り返し基部6aに接触すると共に、検査用導通ピンd<sub>1</sub>'は金メッキを施した雌型電気接触部2の入口に設けられた識別用付加部2cに接触し、それぞれの検査回路において導通の判定を表示する。

【0019】所定の端子収容室1'において、金メッキを施した端子金具C<sub>1</sub>'の代わりに錫メッキを施した端子金具C<sub>2</sub>'が誤挿入されている場合には、検査用導通ピンd<sub>1</sub>'は検査回路を導通させることが出来ないで、金メッキを施した端子金具C<sub>1</sub>'の欠落を表示する。

【0020】図9の構造では、通常の錫メッキを施した雄型端子金具C<sub>2</sub>"に対して、金メッキを施した雄型端子金具C<sub>1</sub>"における雄タブ状電気接触部2'の後方下部に識別用付加部2a'が設けられており、図8の場合と同様に、軸方向の突出量の異なる2種類の検査用導通ピンを用いて金メッキを施した雄型端子金具の存否と共に各端子金具の導通検査を行なう。

#### 【0021】

【発明の効果】請求項1の発明においては、複数の端子金具を該端子金具に設けた識別用付加部を介して検査することが可能であり、同時に各端子金具の導通検査も行うことが出来る。

【0022】請求項2の発明においては、2種類の端子金具をその一方にのみ識別用付加部を設けることによって検査することが可能であり、同時に各端子金具の導通検査を行うことが出来る。

【図面の簡単な説明】

【図1】被検査コネクタの前方斜視図である。

【図2】(A) (B)は2種類の被検査端子金具の斜視図である。

【図3】検査具の斜視図である。

【図4】検査状態の平面図である。

【図5】(A) (B)は検査状態の説明図である。

【図6】他の被検査端子金具の一方について、(A)斜視図、(B)正面図、(C)断面図である。

【図7】他の被検査端子金具の他方について、(A)斜視図、(B)正面図、(C)断面図である。

\*

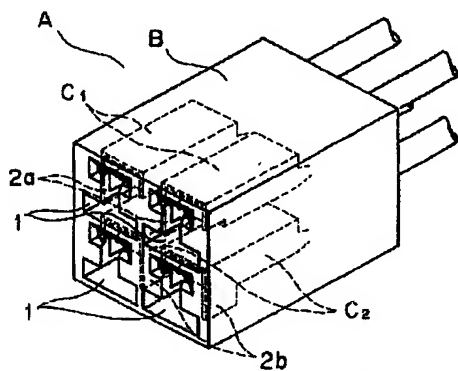
\*【図8】コネクタの検査状態を示す断面図である。

【図9】(A) (B)は更に他の被検査端子金具についての側面図である。

【符号の説明】

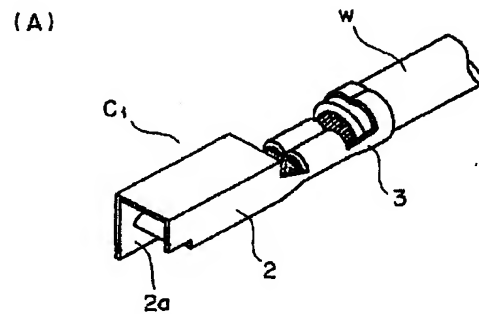
A, A'	多極コネクタ
C <sub>1</sub> , C <sub>2</sub> , C <sub>1</sub> ', C <sub>2</sub> ', C <sub>1</sub> ", C <sub>2</sub> "	端子金具
D, D'	検査具
d <sub>1</sub> , d <sub>2</sub> , d <sub>1</sub> ', d <sub>2</sub> '	検査用導通ピン
1, 1'	端子収容室
2a, 2b, 2c, 2a'	識別用付加部

【図1】

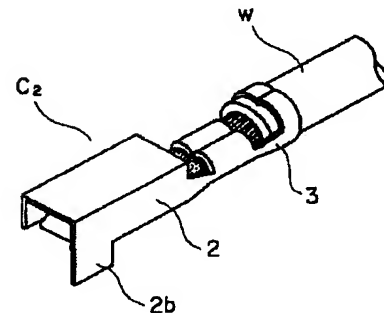


A……多極コネクタ  
C<sub>1</sub> ……端子金具  
C<sub>2</sub> ……端子金具  
1 ……端子収容室  
2a, 2b…識別用付加部

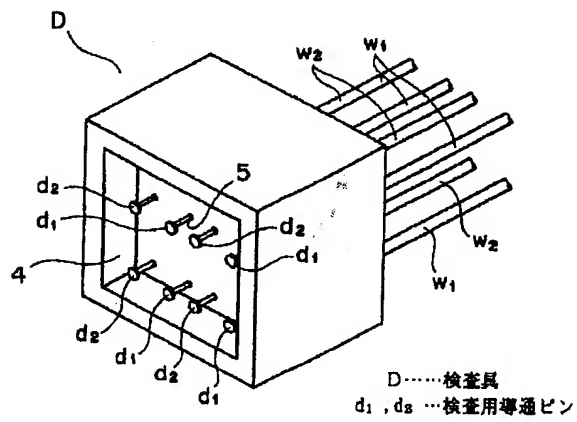
【図2】



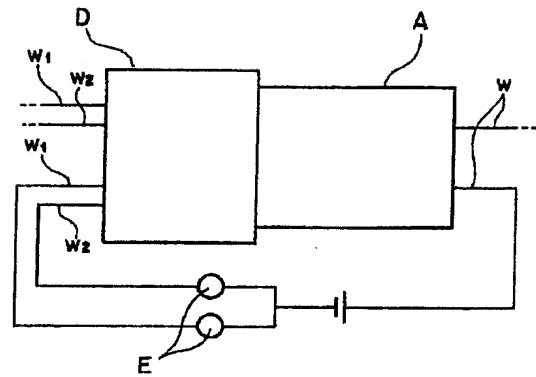
(B)



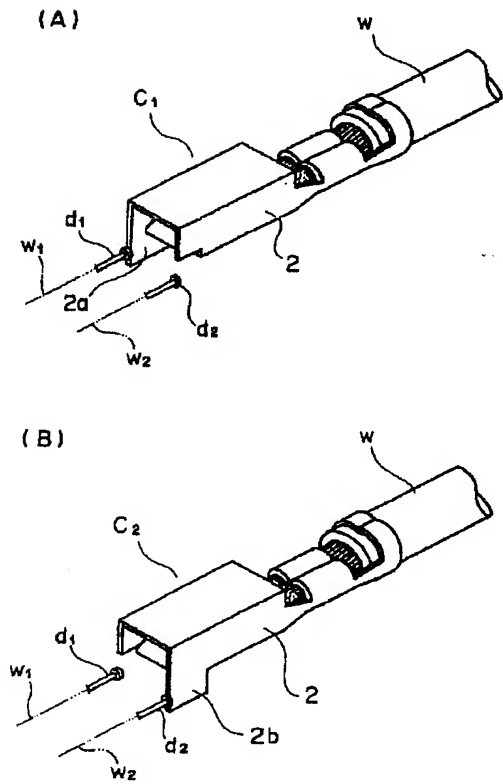
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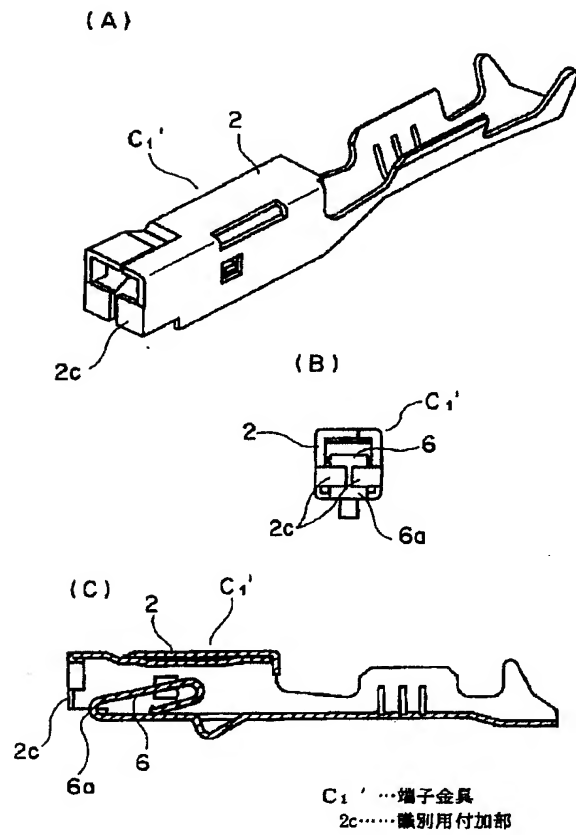
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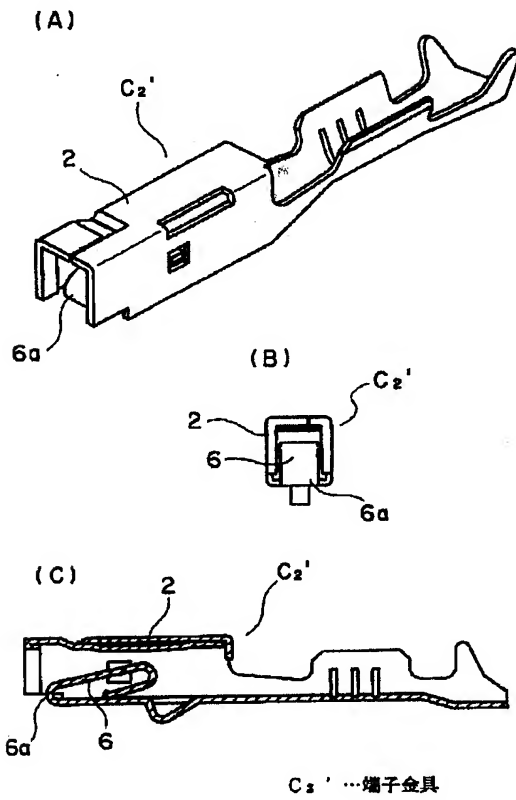
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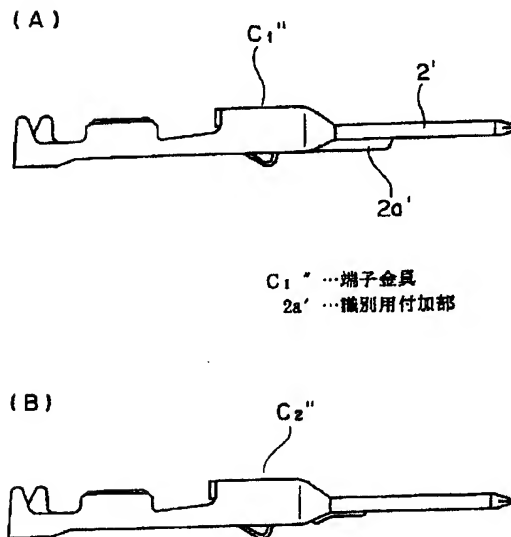
【図6】



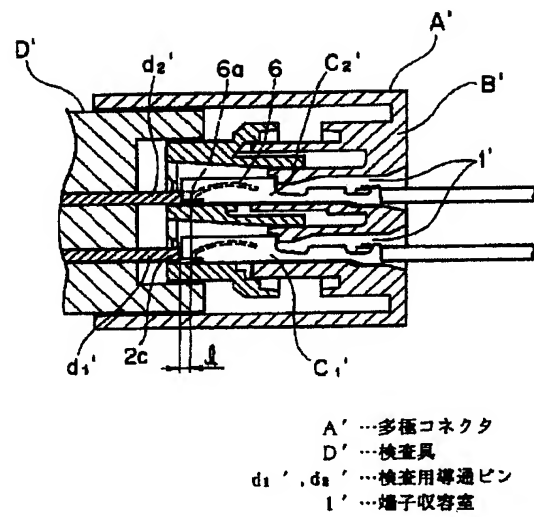
【図7】



【図9】



【図8】



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#### Notes:

1. Untranslatable words are replaced with asterisks (\*\*\*\*).
2. Texts in the figures are not translated and shown as it is.

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## CLAIMS

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### [Claim(s)]

[Claim 1] In the inspection method of two or more kinds of terminal metal fittings held in two or more terminal hold rooms of a multiple connector The adjunct for discernment is prepared in a location which is mutually different to each terminal metal fittings of these two or more classes. While preparing two or more checking flow pin groups corresponding to these two or more adjuncts for discernment in an inspection implement corresponding to two or more terminal hold rooms, each checking flow pin is connected to a checking circuit, respectively. The terminal metal-fittings inspection method of the multiple connector characterized by contacting any one in these two or more checking flow pin groups to the adjunct for discernment of terminal metal fittings at the time of inspection.

[Claim 2] In the inspection method of two kinds of terminal metal fittings held in two or more terminal hold rooms of a multiple connector this -- preparing the adjunct for discernment in one side of two kinds of terminal metal fittings -- an inspection implement -- this -- [ two kinds of checking flow pins / prepare and ] corresponding to two or more terminal hold rooms individually while preparing two kinds of checking flow pins in a checking circuit corresponding to two kinds of terminal metal fittings The checking flow pin of these two classes is the terminal metal-fittings inspection method of the multiple connector characterized by the projecting amount of shaft orientations being mutually different, and only one side of this checking flow pin contacting this adjunct for discernment at the time of inspection.

[Claim 3] The terminal metal-fittings inspection method of the multiple connector according to claim 1 or 2 characterized by for two or more kinds of terminal metal fittings having identical shape substantially, and differing in a composition metal raw material.

[Claim 4] Claim 1 characterized by differing in the metal with which two or more kinds of terminal metal fittings were plated, 2, or the terminal metal-fittings inspection method of a multiple connector given in 3.

[Claim 5] Claim 1 characterized by consisting of the terminal metal fittings by which tinning was carried out to the terminal metal fittings by which two or more kinds of terminal metal

fittings were gold-plated, 2 and 3, or the terminal metal-fittings inspection method of a multiple connector given in 4.

[Claim 6] Corresponding to each terminal hold room of an inspected connector, two or more checking flow pin groups are prepared. The terminal metal-fittings inspection implement of the multiple connector characterized by connecting these two or more checking flow pins to a checking circuit, respectively, and one in these two or more checking flow pin groups contacting the terminal metal fittings of an inspected connector at the time of inspection.

[Claim 7] It is the terminal metal-fittings inspection implement of a multiple connector with which this checking flow pin is connected to a checking circuit, respectively while preparing either of two kinds of checking flow pins corresponding to each terminal hold room of an inspected connector, and the checking flow pin of these two classes is characterized by the projecting amount of shaft orientations being mutually different.

## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] [ when this invention holds two or more kinds of terminal metal fittings based on a difference of a composition metal raw material in the terminal hold interior of a room of this multiple connector about the multiple connector used for connection of wire harness etc. ] It is related with the method of inspecting whether the terminal metal fittings which consisted of specific metal materials are held in the specific terminal hold room, and its inspection implement.

[0002]

[Description of the Prior Art] It is under [ connector / which the electric wire for safety circuits is contained in the wire harness for automobiles in addition to the usual electric wire for signal circuits, bundles up these electric wires, and connects ] setting. To the electric wire for signal circuits, the terminal metal fittings which performed tinning to the surface of the copper raw material are used, and the terminal metal fittings which gold-plated as an object for electrical connection which surpasses soundness are used to the electric wire for safety circuits.

[0003] By the way, since the tinning terminal and gold plate terminal in this case are usually identical shape, in the conduction test, detection of wrong insertion is impossible, therefore it is identifying by the visual inspection, but soundness is missing.

[0004]

[Problem(s) to be Solved by the Invention] Paying attention to the above-mentioned point, it succeeds in this invention, and it identifies certainly two or more terminal metal fittings which were held into the multiple connector and which have identical shape substantially





[0011]

[Example] In drawing 1, multiple connector A has four terminal hold rooms 1 in the connector housing B made of synthetic resin. Female terminal metal-fittings C1 which performed gold plate for safety circuits to two terminal hold rooms 1 of an upper case Female terminal metal-fittings C2 which were held and performed tinning for signal circuits to two terminal hold rooms 1 of the lower berth It holds.

[0012] As shown in drawing 2, it is both female terminal metal-fittings C1 and C2. While the wire connection 3 is formed successively by the female mold electric contact section 2, are identical shape and only a composition metal raw material is different from the real target to which lead wire W was connected in the wire connection 3 with a difference of the class of plating, and however female terminal metal-fittings C1 which gold-plated \*\*\*\* -- female terminal metal-fittings C2 which the adjunct 2a for discernment which projected at the lower left of [ front ] the female mold electric contact section 2 was formed, and performed tinning \*\*\*\* -- adjunct 2b for discernment which projected at the lower right of [ front ] the female mold electric contact section 2 is prepared.

[0013] D is the checking flow pin d1 of a couple, and d2 [ in the laboratory 4 in which it is an inspection implement and multiple connector A is accepted ]. Four sets of groups are prepared corresponding to each terminal hold room 1 of multiple connector A. Each flow pin d1 and d2 It is energized to the front with the spring (not shown) which sliding is free and is built in in the support hole 5, and retreats a little in contact with terminal metal fittings at the time of inspection. Checking flow pin d1 Female terminal metal-fittings C1 which gold-plated It is an object for detection and is the electric wire W1 of an inspecting circuit. It connects and is the checking flow pin d2. Female terminal metal-fittings C2 which performed tinning It is an object for detection and is the electric wire W2 of an inspecting circuit. It connects.

[0014] As shown in drawing 4 at the time of inspection, the inspected connector A is inserted into the laboratory 4 of the inspection implement D. And female terminal metal-fittings C1 which gold-plated It is the checking flow pin d1 to the adjunct 2a for discernment. It contacts and is an electric wire W1. The inspecting circuit to depend is operated and it is the checking flow pin d2 in this case. This terminal metal-fittings C1 It does not contact (refer to drawing 5 (A)). On the other hand, female terminal metal-fittings C2 which performed tinning It is the checking flow pin d2 to adjunct 2b for discernment. It contacts and is an electric wire W2. The inspecting circuit to depend is operated and it is the checking flow pin d1 in this case. This terminal metal-fittings C2 It does not contact (refer to drawing 5 (B)).

[0015] Therefore, terminal metal-fittings C1 which performed the gold plate or tinning held in the specific terminal hold room 1 and C2 Electric wire W1 which should correspond and operate Or electric wire W2 The inspecting circuit to depend is set up beforehand. As the

[0016] In the female mold electric contact section 2 which opened the front end of female terminal metal-fittings C2 ' which performed the usual tinning with the structure of drawing 6 and drawing 7 , mind the front clinch base 6a and the elastic contact piece 6 is formed by return (refer to drawing 7 ). In the female mold electric contact section 2 of female terminal metal-fittings C1 ' which gold-plated, Base 6a is minded by return similarly, and while the elastic contact piece 6 is formed by return, the adjunct 2c for discernment is bent and formed in the front end lower part of the female mold electric contact section 2 inside the side attachment wall.

[0017] The existence or nonexistence of terminal metal-fittings C1 ' which inserted female terminal metal-fittings C1 ' and multiple connector A' which held C2 ' in terminal hold room 1' of connector housing B' into inspection implement D', and gold-plated simultaneously with a conduction test are inspected. Namely, in inspection implement D', checking flow pin d2 of female terminal metal-fittings C2 ' which performed checking flow pin d1 ' or tinning of female terminal metal-fittings C1 ' which gold-plated corresponding to each terminal hold room 1'' is prepared. Sliding of each checking flow pin d1 ' and d2 ' is enabled, they are energized and prepared in a front fixed protrusion position, and the head of checking flow pin d2 ' is located ahead [ shaft-orientations ] only the dimension l (about 1.5mm) rather than the head of checking flow pin d1 ' (refer to drawing 8 ).

[0018] Therefore, [ ' ] at the time of inspection while checking flow pin d2 ' contacts the clinch base 6a of the elastic contact piece 6 in the female mold electric contact section 2 which performed tinning Checking flow pin d1 ' contacts the adjunct 2c for discernment prepared in the inlet port of the female mold electric contact section 2 which gold-plated, and displays the judgment of a flow in each inspecting circuit.

[0019] In predetermined terminal hold room 1', since checking flow pin d1 ' cannot make it flow through an inspecting circuit when wrong insertion of terminal metal-fittings C2 ' which performed tinning instead of terminal metal-fittings C1 ' which gold-plated is carried out, lack of terminal metal-fittings C1 ' which gold-plated is displayed.

[0020] As opposed to male terminal metal-fittings C2 " which performed the usual tinning with the structure which is drawing 9 Adjunct 2a' for discernment is prepared in the back lower part of male tab-like electric contact section 2' in male terminal metal-fittings C1 " which gold-plated. The conduction test of each terminal metal fittings is conducted with the existence or nonexistence of the male terminal metal fittings which gold-plated like the case of drawing 8 using two kinds of checking flow pins by which the projecting amounts of shaft orientations differ.

[0021]

[Effect of the Invention] In invention of Claim 1, it is possible to inspect through the adjunct for discernment which formed two or more terminal metal fittings in these terminal metal fittings, and the conduction test of each terminal metal fittings can also be conducted simultaneously.

[0022] In invention of Claim 2, it is possible to inspect two kinds of terminal metal fittings by

preparing the adjunct for discernment only in one of these, and the conduction test of each terminal metal fittings can be conducted simultaneously.

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[Translation done.]

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**Notes:**

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## CLAIMS

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**[Claim(s)]**

[Claim 1] In the inspection method of two or more kinds of terminal metal fittings held in two or more terminal hold rooms of a multiple connector The adjunct for discernment is prepared in a location which is mutually different to each terminal metal fittings of these two or more classes. While preparing two or more checking flow pin groups corresponding to these two or more adjuncts for discernment in an inspection implement corresponding to two or more terminal hold rooms, each checking flow pin is connected to a checking circuit, respectively. The terminal metal-fittings inspection method of the multiple connector characterized by contacting any one in these two or more checking flow pin groups to the adjunct for discernment of terminal metal fittings at the time of inspection.

[Claim 2] In the inspection method of two kinds of terminal metal fittings held in two or more terminal hold rooms of a multiple connector this -- preparing the adjunct for discernment in one side of two kinds of terminal metal fittings -- an inspection implement -- this -- [ two kinds of checking flow pins / prepare and ] corresponding to two or more terminal hold rooms individually while preparing two kinds of checking flow pins in a checking circuit corresponding to two kinds of terminal metal fittings The checking flow pin of these two classes is the terminal metal-fittings inspection method of the multiple connector characterized by the projecting amount of shaft orientations being mutually different, and only one side of this checking flow pin contacting this adjunct for discernment at the time of inspection.

[Claim 3] The terminal metal-fittings inspection method of the multiple connector according to claim 1 or 2 characterized by for two or more kinds of terminal metal fittings having identical shape substantially, and differing in a composition metal raw material.

[Claim 4] Claim 1 characterized by differing in the metal with which two or more kinds of terminal metal fittings were plated, 2, or the terminal metal-fittings inspection method of a multiple connector given in 3.

[Claim 5] Claim 1 characterized by consisting of the terminal metal fittings by which tinning was carried out to the terminal metal fittings by which two or more kinds of terminal metal

fittings were gold-plated, 2 and 3, or the terminal metal-fittings inspection method of a multiple connector given in 4.

[Claim 6] Corresponding to each terminal hold room of an inspected connector, two or more checking flow pin groups are prepared. The terminal metal-fittings inspection implement of the multiple connector characterized by connecting these two or more checking flow pins to a checking circuit, respectively, and one in these two or more checking flow pin groups contacting the terminal metal fittings of an inspected connector at the time of inspection.

[Claim 7] It is the terminal metal-fittings inspection implement of a multiple connector with which this checking flow pin is connected to a checking circuit, respectively while preparing either of two kinds of checking flow pins corresponding to each terminal hold room of an inspected connector, and the checking flow pin of these two classes is characterized by the projecting amount of shaft orientations being mutually different.

## DETAILED DESCRIPTION

---

[Detailed Description of the Invention]

[0001]

[Industrial Application] [ when this invention holds two or more kinds of terminal metal fittings based on a difference of a composition metal raw material in the terminal hold interior of a room of this multiple connector about the multiple connector used for connection of wire harness etc. ] It is related with the method of inspecting whether the terminal metal fittings which consisted of specific metal materials are held in the specific terminal hold room, and its inspection implement.

[0002]

[Description of the Prior Art] It is under [ connector / which the electric wire for safety circuits is contained in the wire harness for automobiles in addition to the usual electric wire for signal circuits, bundles up these electric wires, and connects ] setting. To the electric wire for signal circuits, the terminal metal fittings which performed tinning to the surface of the copper raw material are used, and the terminal metal fittings which gold-plated as an object for electrical connection which surpasses soundness are used to the electric wire for safety circuits.

[0003] By the way, since the tinning terminal and gold plate terminal in this case are usually identical shape, in the conduction test, detection of wrong insertion is impossible, therefore it is identifying by the visual inspection, but soundness is missing.

[0004]

[Problem(s) to be Solved by the Invention] Paying attention to the above-mentioned point, it succeeds in this invention, and it identifies certainly two or more terminal metal fittings which were held into the multiple connector and which have identical shape substantially

[Means for Solving the Problem] In order to attain the above-mentioned object, it sets to this invention method. In the inspection method of two or more kinds of terminal metal fittings held in two or more terminal hold rooms of a multiple connector The adjunct for discernment is prepared in a location which is mutually different to each terminal metal fittings of these two or more classes. While preparing two or more checking flow pin groups corresponding to these two or more adjuncts for discernment in an inspection implement corresponding to two or more terminal hold rooms, each checking flow pin is connected to a checking circuit, respectively. The composition which contacts any one in these two or more checking flow pin groups to the adjunct for discernment of terminal metal fittings at the time of inspection was adopted.

[0006] Moreover, in this invention method, it sets to the inspection method of two kinds of terminal metal fittings held in two or more terminal hold rooms of a multiple connector. this -  
 - preparing the adjunct for discernment in one side of two kinds of terminal metal fittings --  
 an inspection implement -- this -- [ two kinds of checking flow pins / prepare and ]  
 corresponding to two or more terminal hold rooms individually while preparing two kinds of checking flow pins in a checking circuit corresponding to two kinds of terminal metal fittings  
 The checking flow pin of these two classes adopted the composition to which the projecting amount of shaft orientations is mutually different, and only one side of this checking flow pin contacts this adjunct for discernment at the time of inspection.

[0007] Moreover, in the inspection implement of this invention, two or more checking flow pin groups are prepared corresponding to each terminal hold room of an inspected connector. These two or more checking flow pins were connected to the checking circuit, respectively, and one in these two or more checking flow pin groups adopted the composition in contact with the terminal metal fittings of an inspected connector at the time of inspection.

[0008] Furthermore, in the inspection implement of this invention, while preparing either of two kinds of checking flow pins corresponding to each terminal hold room of an inspected connector, this checking flow pin was connected to the checking circuit, respectively, and the checking flow pin of these two classes adopted the composition to which the projecting amount of shaft orientations is mutually different.

[0009]

[Function] In two or more checking flow pin groups prepared corresponding to two or more adjuncts for discernment, only the checking flow pin which counters the adjunct for discernment of the inspected terminal metal fittings concerned at the time of inspection operates a checking circuit.

[0010] In the checking flow pin by which the projecting amounts of shaft orientations differ and whose number is two, the checking flow pin with many projecting amounts always contacts inspected terminal metal fittings, and the checking flow pin with few projecting amounts contacts this, only when the special terminal metal fittings corresponding to this are held.

[0011]

[Example] In drawing 1, multiple connector A has four terminal hold rooms 1 in the connector housing B made of synthetic resin. Female terminal metal-fittings C1 which performed gold plate for safety circuits to two terminal hold rooms 1 of an upper case Female terminal metal-fittings C2 which were held and performed tinning for signal circuits to two terminal hold rooms 1 of the lower berth It holds.

[0012] As shown in drawing 2, it is both female terminal metal-fittings C1 and C2. While the wire connection 3 is formed successively by the female mold electric contact section 2, are identical shape and only a composition metal raw material is different from the real target to which lead wire W was connected in the wire connection 3 with a difference of the class of plating, and however female terminal metal-fittings C1 which gold-plated \*\*\*\* -- female terminal metal-fittings C2 which the adjunct 2a for discernment which projected at the lower left of [ front ] the female mold electric contact section 2 was formed, and performed tinning \*\*\*\* -- adjunct 2b for discernment which projected at the lower right of [ front ] the female mold electric contact section 2 is prepared.

[0013] D is the checking flow pin d1 of a couple, and d2 [ in the laboratory 4 in which it is an inspection implement and multiple connector A is accepted ]. Four sets of groups are prepared corresponding to each terminal hold room 1 of multiple connector A. Each flow pin d1 and d2 It is energized to the front with the spring (not shown) which sliding is free and is built in in the support hole 5, and retreats a little in contact with terminal metal fittings at the time of inspection. Checking flow pin d1 Female terminal metal-fittings C1 which gold-plated It is an object for detection and is the electric wire W1 of an inspecting circuit. It connects and is the checking flow pin d2. Female terminal metal-fittings C2 which performed tinning It is an object for detection and is the electric wire W2 of an inspecting circuit. It connects.

[0014] As shown in drawing 4 at the time of inspection, the inspected connector A is inserted into the laboratory 4 of the inspection implement D. And female terminal metal-fittings C1 which gold-plated It is the checking flow pin d1 to the adjunct 2a for discernment. It contacts and is an electric wire W1. The inspecting circuit to depend is operated and it is the checking flow pin d2 in this case. This terminal metal-fittings C1 It does not contact (refer to drawing 5 (A)). On the other hand, female terminal metal-fittings C2 which performed tinning It is the checking flow pin d2 to adjunct 2b for discernment. It contacts and is an electric wire W2. The inspecting circuit to depend is operated and it is the checking flow pin d1 in this case. This terminal metal-fittings C2 It does not contact (refer to drawing 5 (B)).

[0015] Therefore, terminal metal-fittings C1 which performed the gold plate or tinning held in the specific terminal hold room 1 and C2 Electric wire W1 which should correspond and operate Or electric wire W2 The inspecting circuit to depend is set up beforehand. As the



[0016] In the female mold electric contact section 2 which opened the front end of female terminal metal-fittings C2 ' which performed the usual tinning with the structure of drawing 6 and drawing 7 , mind the front clinch base 6a and the elastic contact piece 6 is formed by return (refer to drawing 7 ). In the female mold electric contact section 2 of female terminal metal-fittings C1 ' which gold-plated, Base 6a is minded by return similarly, and while the elastic contact piece 6 is formed by return, the adjunct 2c for discernment is bent and formed in the front end lower part of the female mold electric contact section 2 inside the side attachment wall.

[0017] The existence or nonexistence of terminal metal-fittings C1 ' which inserted female terminal metal-fittings C1 ' and multiple connector A' which held C2 ' in terminal hold room 1' of connector housing B' into inspection implement D', and gold-plated simultaneously with a conduction test are inspected. Namely, in inspection implement D', checking flow pin d2 of female terminal metal-fittings C2 ' which performed checking flow pin d1 ' or tinning of female terminal metal-fittings C1 ' which gold-plated corresponding to each terminal hold room 1' ' is prepared. Sliding of each checking flow pin d1 ' and d2 ' is enabled, they are energized and prepared in a front fixed protrusion position, and the head of checking flow pin d2 ' is located ahead [ shaft-orientations ] only the dimension l (about 1.5mm) rather than the head of checking flow pin d1 ' (refer to drawing 8 ).

[0018] Therefore, [ ' ] at the time of inspection while checking flow pin d2 ' contacts the clinch base 6a of the elastic contact piece 6 in the female mold electric contact section 2 which performed tinning Checking flow pin d1 ' contacts the adjunct 2c for discernment prepared in the inlet port of the female mold electric contact section 2 which gold-plated, and displays the judgment of a flow in each inspecting circuit.

[0019] In predetermined terminal hold room 1', since checking flow pin d1 ' cannot make it flow through an inspecting circuit when wrong insertion of terminal metal-fittings C2 ' which performed tinning instead of terminal metal-fittings C1 ' which gold-plated is carried out, lack of terminal metal-fittings C1 ' which gold-plated is displayed.

[0020] As opposed to male terminal metal-fittings C2 " which performed the usual tinning with the structure which is drawing 9 Adjunct 2a' for discernment is prepared in the back lower part of male tab-like electric contact section 2' in male terminal metal-fittings C1 " which gold-plated. The conduction test of each terminal metal fittings is conducted with the existence or nonexistence of the male terminal metal fittings which gold-plated like the case of drawing 8 using two kinds of checking flow pins by which the projecting amounts of shaft orientations differ.

[0021]

[Effect of the Invention] In invention of Claim 1, it is possible to inspect through the adjunct for discernment which formed two or more terminal metal fittings in these terminal metal fittings, and the conduction test of each terminal metal fittings can also be conducted simultaneously.

[0022] In invention of Claim 2, it is possible to inspect two kinds of terminal metal fittings by

preparing the adjunct for discernment only in one of these, and the conduction test of each terminal metal fittings can be conducted simultaneously.

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[Translation done.]

(19)



JAPANESE PATENT OFFICE

## PATENT ABSTRACTS OF JAPAN

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(21) Application number: **08015240**(22) Date of filing: **09.02.94**(71) Applicant: **YAZAKI CORP**

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**TSUCHIYA TAKAYUKI**  
**ETO HIDENORI**

(54) **TERMINAL METAL FITTING INSPECTING  
 METHOD AND INSPECTING TOOL FOR  
 MULTIPOLAR CONNECTOR**

(57) Abstract:

**PURPOSE:** To inspect electric communication by installing a group of electric communication inspecting pins, which correspond to respective terminal storage chambers, in distinguishing additive parts formed at mutually different positions of a plurality of types of respective terminal metal fittings.

**CONSTITUTION:** In a multipolar connector, female type terminal metal fittings  $C_1$  and  $C_2$  coated with gold and tin are stored in two terminal chambers in respective upper and lower steps. Distinguishing additive parts 2a, 2b projected toward the lower left and the lower right of the front of a female type electric contact part 2 are formed in these metal fittings  $C_1$  and  $C_2$ . An inspecting tool D has four pairs of electric communication inspecting pins  $d_1, d_2$  which correspond to the metal fittings  $C_1, C_2$  and are put in an inspecting chamber 4 in the way they can slide freely in a supporting hole 5 and the tool D is pressed forward by a built-in spring. When a multipolar connector is inserted into the inspection chamber 4, the additive parts 2a, 2b of the metal fittings  $C_1, C_2$  are brought into contact with

the pins  $d_1, d_2$  but not with the pins  $d_2, d_1$ . Consequently, electric communication and error insertion can be inspected simultaneously.

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